

THE MINERAL INDUSTRY OF TAJIKISTAN

By Richard M. Levine

Nonferrous metals and precious metals production were the leading sectors of Tajikistan's mineral industry. Tajikistan mined antimony, bismuth, copper, gold, lead, mercury, molybdenum, silver, tungsten, and zinc and produced aluminum from imported raw materials. Tajikistan also extracted industrial minerals and mineral fuels including coal, gas, oil, and uranium.

Tajikistan's resources include a wide range of metals and industrial minerals as well as mineral fuels. Metal resources include alunite, antimony, bauxite, bismuth, cadmium, copper, gold, iron, lead, manganese, mercury, molybdenum, nepheline syenite, nickel, selenium, silver, strontium, tin, tungsten, and zinc. Nonmetallic resources include barite, boron, construction materials, dolomite, fluorspar, phosphates, precious and semiprecious stones, and salt. Resources of mineral fuels include coal, natural gas, oil shale, peat, petroleum, and uranium. Tajikistan contains large silver reserves which it hopes to develop with the aid of foreign investment. It is also rich in natural rubies and has large antimony reserves. Of the former Soviet Union's 34 explored antimony deposits, 9 occur in Tajikistan.

In 1996, Tajikistan reported a continuing decrease in its gross domestic product (GDP) with GDP decreasing 17% compared with that of 1995. Industrial output reportedly fell by 19.8%. Since the breakup of the Soviet Union in 1991, the GDP in Tajikistan reportedly has decreased by 47% and industrial output by 60% (Interfax Statistical Report, 1997b). Tajikistan's main export in 1996 was primary aluminum which accounted for about 35% of the total value of Tajikistan's exports. Tajikistan's main imports were oil products totaling \$64.1 million, equaling about 10% of total imports. Turkmenistan supplied 35% of Tajikistan's oil imports, Uzbekistan 22%, Kazakstan 21%, and Russia 9%. Uzbekistan supplied Tajikistan with 592 million cubic meters of natural gas worth \$37.9 million (Interfax Statistical Report, 1997a).

The civil war in Tajikistan has had serious consequences for Tajikistan's economy. There is a lack of funds for investment and many construction projects have come to a halt. The instability brought on by the civil war is hampering foreign investment. Nevertheless, foreign firms are engaged in developing gold, silver, and high-quality coal deposits.

Emigration is causing Tajikistan's economy difficulties as citizens with high technical qualifications are leaving. Industry in Tajikistan has encountered the problem of a shortage of trained personnel. From 1991 to mid-1996, more than 450,000 ethnic Russians had left Tajikistan (Nezavisimaya Gazeta, 1996).

In 1996, the Tajik Aluminum Smelter, the only primary aluminum producer in Tajikistan, was under the protection of Commonwealth of Independent States (CIS) peace-keeping forces stationed in Tajikistan. Fighting had been reported in Dushanbe a few kilometers from the smelter (Interfax Mining and Metals Report, 1997b). In 1996, aluminum production reportedly fell to 198,300 metric tons (t) from 230,000 t in 1995, with output planned to increase in 1997 to 230,000 t (Reuters, 1997). The smelter has the capacity to produce over 500,000 metric tons per year (t/yr). Besides the disruptions caused by the civil war, falling aluminum output was attributed to low power supplies. The smelter also was confronting problems with raw material supplies. It was having serious problems obtaining alumina from Ukraine's Nikolayev refinery, which was the Tajik smelter's chief source of alumina in 1996 and was again to be its chief source in 1997. The Tajik smelter in 1996 exported 193,700 t of aluminum. Countries in Europe that received aluminum from the Tajik smelter included Finland, the Netherlands, and the United Kingdom and within the CIS, Azerbaijan, Belarus, Russia, Turkmenistan, and Uzbekistan (Interfax Mining News, 1997b).

During the Soviet period, gold production in Tajikistan peaked at about 1.5 t/yr, with gold produced from both primary gold mines and recovered as a byproduct of nonferrous ores. In Tajikistan, the gold production sector is attracting foreign investment and is increasing production. The Tajik Government is giving precious metals prospecting priority in funding. When the civil war ends in Tajikistan, the country could significantly increase gold production.

In 1996, Tajikistan produced about 1.5 t of gold and plans to double gold output in 1997 to 3 t. About 2.3 to 2.5 t of this amount is planned to be produced by the Zeravshan Gold Company (ZGC), a joint venture between Tajikistan and Nelson Gold Ltd. of Canada, which owns a 49% stake in the venture. ZGC is developing the Jilau and Taror gold deposits.

ZGC took over mining of the Jilau open pit. In 1996, ZGC produced 1 t of gold from the Jilau lode, falling short of the targeted yearend output of 1.3 t. Nelson Gold reportedly invested \$54 million into the project by the end of 1996. The money was used primarily to commission the first stage of a carbon-in-leach (CIL) mill, with a capacity to produce about 2.4 t/yr (72,000 ounces per year), and a planned final capacity to produce 5 t/yr of gold from lean ores (Interfax Mining News, 1997a).

In August, ZGC announced its first production of gold dore from the Jilau deposit. The gold was refined at the Vostokredmet plant in Chkalovsk. ZGC began milling ore at its

CIL facility in the first quarter of the year. The first stage of the CIL plant has a design capacity to process 60,000 t of ore per month. The ore reportedly graded at 3.2 grams per ton of gold (Interfax Mining and Metals Report, 1996b).

The country's second biggest gold producer in terms of capacity is the Darvaz joint venture with Britain's Gold & Mineral Excavation which owns a 49% stake. It is developing the Yakh-Su alluvial field located in Khatlon Oblast in southern Tajikistan. It reportedly has proven reserves of around 25 t. Owing to the several disruptions of mining operations at Darvaz in 1996, the mine reportedly produced only 500 kilograms(kg) of a targeted 2 t of gold. It produced 900 kg in 1995. Efforts in 1997 are to be directed towards restoring the Darvaz placer mine that was damaged during hostilities near the end of the year. The director stated that the mine employees managed to salvage some equipment, but the fighting caused a great deal of damage. Following the hostilities, the region was reportedly calm, with government troops protecting the mine and its employees (Interfax Mining and Metals Report, 1997a).

Development of the Aprelevka gold lode in the Karamazar district by open pit mining began in 1986, but financial constraints led to the discontinuation of operations in the early 1990's. It was decided to form a joint venture to get the operation restarted. Gulf International Minerals Ltd., a Canadian company, acquired a 49% share in the Aprelevka joint venture with the Government of Tajikistan to develop the Aprelevka gold lode. The venture plans to build a milling facility to treat between 800 and 1,200 tons per day (t/d) of ore, rising eventually to 2,500 t/d of ore. Earlier studies reportedly estimated Aprelevka to contain 13.3 t of gold and 69.4 t of silver. These reserves are expected to increase as a result of further exploration. According to the Tajik State Committee for Precious Metals, the Aprelevka joint venture intends to mine between 100 to 200 kg of gold in 1997 (Interfax Mining and Metals Report, 1997c).

All gold mined in Tajikistan is refined at the Vostokredmet Production Association in Chkalovsk in northern Tajikistan. The Vostokredmet association used to mine and process uranium ore, but now has decided to concentrate its efforts on the production of vanadium, refined precious metals, and jewelry. Vostokredmet's production of uranium peaked in the 1970's and 1980's when it was mining about 500,000 t/yr of ore from the Adrasman, Taboshar, Maylisu, Uisugai deposits in northern Tajikistan, and from deposits in neighboring Uzbekistan. The Tajik deposits still reportedly contain 60% of their originally determined reserves. According to a statement by Vostokredmet's director, production could be quickly brought back to capacity. However, market conditions reportedly were not conducive for uranium production (Interfax Mining and Metals Report, 1996a).

Vostokredmet, through August 1996, produced 7,000 t of vanadium pentoxide; it has the capacity to produce 350,000 t/yr of vanadium pentoxide. It uses as raw materials residual vanadium catalysts from sulfuric acid production based on the waste piles at the Almalyk polymetallic mining and beneficiation enterprise in Uzbekistan as well as from metallurgical enterprises in Russia and Kazakhstan (Interfax Mining and

Metals Report, 1996a).

Tajikistan mines antimony ore at the Anzob mining and beneficiation complex. Tajikistan reportedly has numerous antimony deposits, a number of which are slated for development. The country's antimony reserves reportedly total 290,000 t in reserve categories A, B, C₁ and 510,000 t in reserve category C₂. (Reserves are reported according to the Soviet reserve classification system, which does not necessarily correspond with western definitions of economic reserves). Tajikistan has been sending all of its antimony and mercury concentrate produced at the Anzob mining and metallurgical complex to Kyrgyzstan for processing. However, it was constructing its own antimony and mercury processing plants at Anzob, with the antimony processing facility scheduled to be commissioned in 1997. Also, Tajikistan commissioned its first metallic antimony production plant in 1996 at Isfara in northern Tajikistan. The antimony facility was built as an extension of the state-owned rare metals plant in Isfara. The antimony plant has an initial capacity to produce 500 t/yr of metallic antimony. Long-term plans call for upgrading the Isfara plant's capacity to 2,000 t/yr of metallic antimony (Interfax Mining and Metals Report, 1997d).

Tajikistan potentially can provide for its fuel needs from its own gas and oil reserves. The country's fields reportedly contain reserves of more than 1 trillion cubic meters of gas and 430 million tons of oil. More than 80% of the reserves are located in the south of the country (Narodnaya Gazeta, 1996).

Tajikistan during the Soviet period had a peak production of over 300,000 t/yr of oil, 300 million cubic meters per year of gas, and over 900,000 t/yr of coal. Shortly before the breakup of the Soviet Union in 1989 Tajikistan was producing 190,000 t of oil and 195 billion cubic meters of natural gas. During the Soviet period up to 20 to 30 new oil and gas wells were brought on-line annually and 100,000 meters of drilling was done per year.

Production since the breakup of the Soviet Union has fallen precipitously and Tajikistan's 1996 oil output of 30,000 t and gas output of 50 million cubic meters met only 1% of the country's requirements. In addition, Tajikistan in 1996 produced only 20,000 tons of coal. All exploration to find and develop new gas and oilfields had ceased, but work was underway to increase oil produced from the existing 18 fields.

Prospecting for oil and gas requires large capital investment. The Government does not have the means at present to finance oil and gas prospecting and does not envisage having these funds in the near future. Therefore the country is seeking foreign investment to raise capital for oil and gas development (Narodnaya Gazeta, 1996).

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TABLE 1
TAJIKISTAN: STRUCTURE OF THE MINERAL INDUSTRY FOR 1996

(Metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity e/
Aluminum	Tajik aluminum plant	Tursunzade	500,000.
Antimony	Anzob mining and beneficiation complex	Dzhzhikrutskoye deposit	2,000.
Do.	Isfara metallic antimony plant	Isfara	500.
Bismuth	Leninabad mining and beneficiation complex	Yuzhno-Yangikanskiy deposit	25.
Do.	Isfara hydrometallurgical plant	Isfara	500.
Coal			300,000 total.
Do.	Shurabskoye brown coal	Shurab region	NA.
Do.	Fan-Yagnobskoye hard coal, deposits	Pyandzh region	NA.
Copper	Leninabad mining and beneficiation complex	Yuzhno-Yangikanskiy deposit	NA.
Gold	Tajikzoloto mining-beneficiation complex, Pamir Artel	Darvazy, Rankul placer deposits, placers in central and southern part of country	5.
Do.	Zeravshan gold company (ZGC)	Jilau and Taror deposits	2.4.
Do.	Darvaz joint venture (JV)	Yakh-Su field	2.
Do.	Aprelevka joint venture (JV)	Aprelevka deposit	0.2.
Do.	Vostokredmet refinery	Chkalovsk	NA.
Lead	Leninabad mining and metallurgical complex	Yuzhno-Yangikanskiy deposit	2,500.
Mercury	Anzob mining and beneficiation complex	Dzhzhikrutskoye deposit	150.
Molybdenum	Leninabad mining and beneficiation complex	Yuzhno-Yangikanskiy deposit	NA.
Petroleum and natural gas			100,000 (petroleum) total. 100,000,000 cubic meters (natural gas) total.
Do.	16 oil-gas deposits under exploration, including: Ravatskoye, Ayritanskoye, Madaniyatskoye	Fergana depression	NA.
Do.	Shaambary Beshtentyakskoye, Uzunkhorskoye, Kichik-Belskoye	Southern Tajik depression	NA.
Vanadium pentoxide	Vostokredmet plant	Chkalovsk	350,000.
Uranium	Adrasman, Maylisu, Taboshar, Usugai deposits	northern Tajikistan	NA.
Do.	Vostokredmet processing plant	Chkalovsk	NA.
Zinc	Leninabad mining and beneficiation complex	Yuzho-Yangikanskiy deposit	NA.

e/Estimated. NA Not available.